What's my target? Analyst forecast dispersion and earnings management through effective tax rates

ABSTRACT

Kirk, Reppenhagen, and Tucker (2014) report that, consistent with the existence of private information, investors use individual analyst forecasts as additional benchmarks to evaluate reported earnings. Following this logic, we investigate whether managers consider the private information in a subset of analyst forecasts when managing earnings. Specifically, we test whether changes in year-end tax accruals are associated with analyst forecast dispersion, our measure of private information. We find that when pre-managed earnings would have beat the consensus and analyst private information is low (i.e., dispersion is low), managers increase tax expense and create cookie jar reserves. When analyst forecasts reflect increased levels of private information (i.e., dispersion is high), we find that firms use tax expense to further increase earnings even when pre-managed earnings would have beat the consensus. Additional analyses reveal that the effect of dispersion is conditional on the proximity of pre-managed earnings to the consensus forecast. Our results highlight how managers consider individual analyst forecasts to calibrate earnings management and contribute to our understanding of earnings management activity around consensus estimates.

Keywords: earnings management; earnings smoothing; analyst forecasts; forecast dispersion; tax expense

JEL classification: H25; M41: M44

Data Availability: *Data are obtained from public sources identified in the paper.*

What's My Target? Analyst Forecast Dispersion and Earnings Management through Effective Tax Rates

1. Introduction

Kirk, Reppenhagen, and Tucker (2014) argue that individual forecasts contain private information over the consensus forecast, and they report that meeting individual analyst forecasts is associated with incremental explanatory power for the market reaction on earnings news. If managers understand how investors react to the perception of private information in analyst's forecasts, then managers have an incentive to manage earnings to satisfy those forecasts. In this study, we posit that the level of analysts' private information is reflected in the variation of individual forecasts, where high (low) levels of private information are reflected in higher (lower) variation in individual forecasts.[1] Using analyst forecast dispersion as a measure of analysts' private information and the differing analyst expectations, we investigate whether earnings management behavior is related to the dispersion in individual analyst forecasts.

Prior studies suggest that the consensus analyst forecast is an important benchmark and that firms attempt to manage earnings upward to avoid the negative market consequences associated with falling short of expectations.[2] At the same time, managers face incentives in some situations to manage earnings downward to create reserves that can be reversed in future periods. For example, when pre-managed earnings exceed a target, managers have an incentive to select income-*decreasing* actions that can be used to increase the expected future rewards (Healy 1985). Thus, managers face different motivations for manipulating firm performance

[1] Analysts interpret public and private information to develop earnings forecasts (Holthausen and Verrecchia 1990; Barron, Kim, Lim, and Stevens 1998), where public information is share amongst all analysts and is reflected in all analysts' earnings forecasts. Thus, the differences in earnings forecasts that results in forecast dispersion is due to private information held by some analysts.

[2] See, for example, Matsumoto (2002); Bartov, Givoly, and Hayn (2002); Kasznik and McNichols (2002); Dechow, Richardson, and Tuna (2003); Brown and Caylor (2005); Graham, Harvey, Rajgopal (2005); Burgstahler and Dichev (1997); Degeorge, Patel, and Zeckhauser (1999); Dhaliwal, Gleason, and Mills (2004); and Burgstahler and Eames (2006).

when pre-managed earnings are on either side of earnings targets.

Although the consensus forecast is an important earnings target around which firms manage earnings (Brown and Caylor 2005), it is a metric that discounts private information within individual analyst forecasts and inefficiently weights analysts' common information relative to private information (Kim et al. 2000). The underweighting of individual analysts' expectations is important because managers face a disincentive to create cookie jar reserves when some relevant expectations exceed the consensus. Specifically, when some of the individual forecasts exceed the consensus by a greater extent, they represent expectations based on private information that could be disappointed even if reported earnings are above the consensus. Thus, we posit that managers are less likely to take purposeful actions that decrease earnings to create reserves for future periods when forecasts are disperse because the firm is more likely to disappoint some investors. In contrast, firms with more precise (less disperse) forecasts have a greater opportunity to create reserves because these managers can be more confident that the firm will still meet or exceed market expectations even if earnings are reduced to some extent.[3]

In this study, we exploit the earnings management through tax expense setting in Dhaliwal, Gleason, and Mills (2004), which provides advantages to examine our research question. Because analysts continuously revise their earnings forecasts during the year as they obtain additional public and private information, we require a setting in which individual forecasts have fully incorporated their private information and in which individual forecasts can be compared to the consensus. The fourth quarter tax expense accrual provides such a setting

[3] See Figure 1, discussed in section 2.2, which illustrates how dispersion makes it more likely that a firm will disappoint some analysts despite being above the consensus. Note that differences in analyst forecasts can result from differences in information or information processing among analysts.

because managers can observe and react to changes in the analyst forecasts by manipulating tax expense up to the end of the year.[4] Prior research demonstrates that managers use tax accruals as a "last chance" to manage earnings prior to preparing the financial statements (Dhaliwal et al. 2004; Graham et al. 2012). Systematic increases in the ETR from the third to fourth quarter are consistent with earnings management to create cookie jar reserves, while systematic decreases in ETR from the third to fourth quarter are consistent with upward earnings management (e.g., to meet or beat expectations).[5] This is a crucial advantage to our research design and not possible using other potential indicators of earnings management, such as discretionary accruals, which do not require an annual estimate in third quarter.

In addition, prior research suggests that tax expense requires a significant amount of estimation and judgment, and managers update tax expense by negotiating with auditors immediately prior to earnings announcements (Dhaliwal et al. 2004; Graham et al. 2012). Managers consider a number of issues that affect tax expense and require estimation and judgement, such as mix of income from multiple jurisdictions, tax credits, uncertain tax positions, and valuation allowances. Thus, these mechanisms provide a significant amount of discretion in tax expense reporting that affords managers a last opportunity to manage earnings. However, because our purpose is to investigate the overall effects of manager's perception of private information, we leave the determination of the specific mechanism through which managers manipulate tax expense to future studies.

We find that when analysts private information is low (i.e., forecast dispersion is low)

[4] We acknowledge that we cannot fully rule out the use of other earnings management techniques, such as real earnings management, during the year. However, because we can directly observe tax expense changes in the 4th quarter, this setting allows us to focus on year-end earnings management actions and control for the number and timing of individual forecast revisions.

[5] We acknowledge that changes from 3rd to 4th quarter can be due to unforeseen changes and estimation errors; however, we are interested in systematic *signed* changes, which indicate manipulation up or down on average.

and earnings would have beat analysts' consensus forecast without a change in ETR (i.e., pre-managed earnings exceed the target), firms *increase* their ETR. This result is consistent with firms using tax expense to create cookie jar reserves because consistent expectations among analysts allows for firms to manage earnings toward a precise benchmark. However, firms increase their ETR to a lesser extent as analyst private information and forecast dispersion increases. This result is consistent with decreased incentives to create reserves when the earnings target is less precise because of the presence of private information and differing expectations. In fact, we find evidence that firms with pre-managed earnings greater than the target *decrease* their ETR when forecast dispersion is high. In other words, firms covered by analysts with varying expectations increase earnings even though pre-managed earnings already exceed the consensus. These results contribute to the earnings management literature by providing a greater understanding of earnings management activity around analysts' forecasts.

We also examine the *change* in analyst forecast dispersion from the third to fourth quarter to further isolate the association between the precision of the market's expectations and year-end earnings management behavior. We find that decreases in dispersion during fourth quarter are positively associated with last-chance earnings management actions to create cookie jars. This result suggests that changes in dispersion affect whether firms use tax accruals to manage earnings at year-end and also provides a partial explanation for why prior research has not provided evidence that firms use tax expense to create cookie jar reserves (Graham et al. 2012). Firms have a disincentive to create cookie jar reserves when the earnings target becomes less precise.

In addition to investigating whether dispersion affects the use of tax accruals to manage earnings downwards to create reserves, we investigate whether firms decrease tax expense to

meet or beat earnings targets based on variation in analyst private information (i.e., pre-managed earnings are below the analyst consensus). When pre-managed earnings are below the consensus, it is unclear whether managers will react to analyst forecast dispersion. Managers have an incentive to manage earnings upward to meet the consensus, especially when forecasts are largely based on common information (forecasts are less dispersed). However, the market's earnings expectations are less clear when analysts appear to have private information and forecasts are more dispersed. Following Kirk et al. (2014), managers have an incentive to meet the consensus expectation and the expectations of those analysts with private information, which leads managers to further decrease tax expense to meet the consensus forecast and some forecasts above the consensus. If managers act in a manner consistent with this conjecture, we expect analyst forecast dispersion will be more likely to increase earnings by decreasing ETRs.

We find a negative association between ETR changes and the amount by which the firm would have missed analysts' consensus forecast without changes in ETR (i.e., the extent to which pre-managed earnings are below the target). This result is consistent with prior research (e.g., Dhaliwal et al. 2004) and suggests that firms manage their ETR downward in an attempt to meet or beat the consensus forecast on average. However, consistent with the conflicting incentives discussed above, we find no systematic evidence that the extent of meet or beat activity varies with analyst forecast dispersion. In additional analyses, we find that the effect of dispersion on earnings management actions is conditional on the proximity to the consensus forecast. Specifically, we find a nonlinear effect of dispersion, where dispersion has a reduced effect on meet or beat (cookie jar) behavior as pre-managed earnings are further below (above) the consensus forecast. We also find that our primary results are stronger for firms that issue earnings guidance, consistent with prior research that suggests firms that issue guidance are more

concerned about managing earnings around expectations.

We provide several contributions to the earnings management literature. First, we document that earnings management using tax expense is associated with not only incentives to beat the earnings consensus, but also by the amount of private information contained in analyst forecasts that results in differing targets. Although numerous prior studies suggest that the consensus analyst forecast is an important benchmark for managers, the association between the dispersion of the earnings target and earnings management actions around the benchmark is not well documented in the literature. Second, our study provides evidence that some firms use the discretion available in tax expense to create cookie jar reserves and are more likely to do so when forecast dispersion is low. This result provides a contribution to the literature because it offers a partial explanation regarding the absence of evidence in prior studies that firms use discretion in tax expense to create reserves (e.g., Graham et al. 2012).

Finally, we provide further evidence that the timing with which the earnings target becomes more/less certain affects the timing and the type of earnings management used (i.e., using tax accounts versus other techniques). Prior research does "not provide evidence on how firms choose among earnings management tools" (Dechow et al. 2010, page 385). While prior studies show that managers use specific techniques to manage earnings, such as real earnings management (e.g., Roychowdhury 2006) or tax expense (Dhaliwal et al. 2004) to manage earnings, our study provides evidence regarding the circumstances that affect management's proclivity to use tax expense to manage earnings late in the year.

2. Background and hypothesis development

2.1. Earnings management around benchmarks

Prior studies suggest that earnings benchmarks are relevant to managers. Numerous prior

studies have documented a "kink" in the distribution of reporting around certain earnings benchmarks indicating earnings management activity to meet or beat these earnings targets (see Healy and Wahlen 1999; Habib and Hansen 2008; and Dechow et al. 2010, section 3.1.5, for reviews of the target beating literature).[6] Common benchmarks examined in prior research include "zero" earnings (Hayn 1995), earnings changes (Burgstahler and Dichev 1997), and analysts' consensus forecasts (Degeorge et al. 1999; Burgstahler and Eames 2006). Several prior studies document the incentives to meet earnings expectations. Firm managers are incentivized to meet earnings expectations due to stock price benefits (e.g., DeAngelo et al. 1996; Barth et al. 1999; Kasznik and McNichols 2002; Brown and Caylor 2005; Myers et al. 2007), to reduce the cost of debt (Jiang 2008), and to earn greater compensation (Matsunaga and Park 2001). Taken together, these studies suggest that firm managers have economic benefits to meet or beat earnings benchmarks.

Prior research also acknowledges that firm managers face incentives to smooth earnings or create cookie jar reserves that can be used to increase earnings in future periods. Healy (1985) proposes a theory that when pre-managed earnings are above an earnings target, the manager will have the incentive to select earnings management actions that decrease earnings in the current period, which increases the expected future reward.[7] Similarly, Kirschenheiter and Melumad (2002) examine a model that suggests managers will smooth earnings when news is

[6] The interpretation of the "kink" as evidence of earnings management is not without controversy and is subject to alternative explanations. Dechow et al. (2003) find no difference in discretionary accruals for profit and loss firms. Beaver et al. (2007) suggest the kink around zero earnings can be explained by asymmetric taxes. Durtschi and Easton (2005, 2009) suggest that the kink can be explained by sample bias issues related to scaling earnings by stock price. However, as Dechow et al. (2010, p. 365) suggest, the evidence on earnings management around analysts' forecasts is more persuasive.

[7] While Healy (1985) discusses this theory in the context of an earnings target that provides the manager with a bonus, the theory applies to analyst forecast targets as well. If pre-managed earnings are above the analyst consensus forecast, managers can take action to create cookie jar reserves that can be used to manage earnings upward in future periods.

"good." Consistent with these incentives, Graham et al. (2005) report that 78% of the executives surveyed indicated they would sacrifice economic value in exchange for smoother, more predictable earnings. Overall, prior research acknowledges differing incentives when pre-managed earnings are on either side of earnings targets.

2.1.1. Consensus estimate as a benchmark

Past evidence suggests that the consensus analyst forecast is the most important earnings benchmark (Brown and Caylor 2005). However, recent studies suggest that aggregated estimates, such as the mean or median consensus forecast, omit relevant information within individual forecasts (Kim et al. 2001). Kirk et al. (2014) find evidence that investors consider earnings surprises with respect to individual analyst forecasts in addition to the consensus forecast because of the differences in how individual analysts obtain and process information. Kirk et al. (2014) report significant positive returns around the earnings announcement date only when the firm meets at least 90 percent of forecasts. This evidence suggests that it is likely that managers consider factors other than the consensus forecast when determining the most relevant benchmark.

Anecdotal evidence suggests managers are aware of and concerned about individual estimates that comprise the consensus forecast. For example, when Group 1 Automotive missed its fourth quarter EPS estimate for 2018, CFO John Rickel began his portion of the earnings call by explaining:

> "As of 10:30 P.M. Central Standard Time last night, the consensus in Bloomberg and in FactSet was basically $2.29 per share. Sometime over the overnight hours, a new estimate was entered into the system from our Morgan Stanley analyst, who increased his quarterly estimate from $2.25 to $2.58, an almost 15% increase in expected earnings…We would respectfully suggest to our covering analysts and to our investors that the appropriate thing to do is to ignore that higher estimate that came in late." (Levine 2019)

This example demonstrates that management was aware of how individual estimates affect

expectations and can change the consensus estimate just prior to the earnings announcement. Furthermore, each estimate can differ due to individual analyst characteristics such as the analyst's experience, effort, number of firms and industries covered, and the analyst's brokerage size (O'Brien 1988; Brown 1991; Stickel 1992; Mikhail et al. 1997; Jacob et al. 1999; Clement 1999; Clement and Tse 2003, 2005). Thus, the heterogeneity in analysts' forecasts reflects market's perception that some analysts have access to private information and could have an effect on firms' accounting decisions to satisfy investors' expectations.[8]

2.1.2. Earnings management using tax expense

A body of literature provides evidence that firms use discretion available in the tax accounts to manage earnings upward in an attempt to meet or beat analysts' forecasts but does not provide consistent evidence that firms use the tax accounts to accomplish other earnings goals (see Graham et al. 2012 for a review). Some studies examine specific tax-related accounts, including valuation allowance, permanently reinvested earnings, or uncertain tax positions.[9] These studies provide insight into possible mechanism(s) through which firms can use tax expense to manage earnings, and it is clear that managers have more than one way of exercising discretion to affect tax accruals. Other studies take a more general approach and examine systematic changes in ETRs from quarter to quarter as evidence of tax expense manipulation (e.g., Dhaliwal et al. 2004; Cook et al. 2008; Comprix et al. 2012; Christensen et al. 2015; Gleason et al. 2017). These studies exploit the interim reporting requirement under APB 28 that firms estimate their *annual* ETR at interim reporting periods, providing a point estimate of

[8] We don't investigate specific sources or explanations for dispersed analyst forecasts. Instead, in this paper we take the differences in forecasts as a signal of private information and differing expectations in order to investigate how this dispersion affects the behavior of managers at year-end.

[9] For example, Miller and Skinner (1998), Bauman et al. (2001), Schrand and Wong (2003), and Frank and Rego (2006) examine valuation allowance, Krull (2004) and Graham et al. (2010) examine permanently reinvested earnings, and Cazier et al. (2015) and Gupta et al. (2016) examine uncertain tax positions.

managers' expected annual ETR. They therefore interpret systematic decreases in ETR from 3rd to 4th quarter as evidence of earnings-increasing tax expense manipulation. Because we are interested in the association between analysts' forecast dispersion and firms' tendency to use tax expense late in the year, we exploit this setting to examine ETR changes for firms with incentives to decrease ETR to meet analysts' expectations, or to increase ETR to create cookie jar reserves.

2.2. Hypothesis development

We examine the association between analyst forecast dispersion and tax expense manipulation to 1) decrease earnings to create cookie jar reserves when pre-managed earnings are above the consensus and 2) increase earnings to meet or beat analysts' forecasts when pre-managed earnings are below the consensus. Although the theory that guides our hypotheses is related for each type of earnings management, we make distinct predictions for each.

2.2.1. Earnings management to create reserves

To illustrate the decision to create cookie jar reserves, consider the hypothetical situations outlined for firm A and firm B in Figure 1. At the end of the year, the mean consensus forecast from five analyst forecasts is $1.00 per share. However, firms A and B have pre-managed earnings that exceed the consensus, with pre-managed EPS of $1.03 per share. Thus, both firms could reduce earnings to potentially create income reserves to save for future periods. All five analysts following firm A estimate earnings of $1.00 per share (likely based on common information), providing a precise target. However, for firm B, analysts' earnings forecasts incorporate private information resulting in a range from four cents above the consensus to four cents below it. In fact, although firm B's pre-managed EPS exceeds the consensus, it does not meet analyst E's forecast.

[Insert Figure 1 here]

We expect that the market's perception of the relative presence of private information is likely to reduce firm B's decision to create cookie jar reserves relative to that of firm A. Although firm B and A's earnings exceed the consensus forecast by three cents, firm B is less able to discount the likelihood that the market could perceive some analysts possessed private information. Given that the market responds positively to meeting a larger percentage of forecasts (Kirk et al. 2014), firm B is disincentivized to create cookie jar reserves to ensure it meets expectations. In fact, managers in firm B's situation face an incentive to *increase* earnings to account for the potential of private information. Further, managers of firm A are able to precisely identify expected earnings and decrease earnings without running the risk of falling below expectations and face negative outcomes such as loss of bonuses or jobs (Matsumoto 2002; Matsunaga and Park 2001; Mergenthaler, Rajgopal, and Srinivasan 2011). These arguments suggest that analyst forecast dispersion is associated with less cookie jar behavior. Thus, we state our first hypothesis in alternative form, as follows:

Hypothesis 1: Analyst forecast dispersion is negatively associated with firms' use of tax expense to create cookie jar reserves.

2.2.2. Earnings management to meet or beat

To illustrate the decision to manage earnings facing managers with varying levels of dispersion, consider the hypothetical situations outlined for firm C and firm D in Figure 1. At the end of the year, the mean consensus forecast from five analyst forecasts for firms C and D is $1.00 earnings per share (EPS) and each firm has pre-managed EPS (i.e., before tax expense manipulation) of $0.97 per share. All five analysts following firm C estimate expected earnings of $1.00 per share, so the target is precise. In contrast, analysts' earnings forecasts vary for firm D and range from four cents above the consensus to four cents below it. In this case, the forecasts

in the consensus vary and the target is more disperse (i.e., less precise) even though the consensus is identical to that for firm C. As discussed above, both firms in this scenario have incentives to decrease tax expense in order to increase earnings in an attempt to meet or beat earnings expectations, and prior research provides consistent evidence that firms in this scenario do engage in this type of earnings management on average.

The perception of private information regarding earnings expectations could influence firm D's earnings management decision relative to that of firm C. Kirk et al. (2014) find that the market does not just react to meeting or beating the consensus, but also the percentage of forecasts met. Hence, even if managers in firm C's situation attempt to increase earnings by three or four cents to meet/beat the consensus, managers in firm D's situation have an incentive to increase earnings beyond the consensus to meet a higher percentage of forecasts. For example, in this situation firm D would require an increase of seven cents to meet analyst E's expectations. Following Kirk et al (2014), we would expect a positive association between meet or beat behavior and analyst forecast dispersion because managers perceive that there is greater reward to substantially beat the consensus. That is, firm D will manage earnings to a greater extent than firm C and has an incentive to overshoot the consensus. Hence, we state our second hypothesis in alternative form, as follows:

Hypothesis 2: Analyst forecast dispersion is positively associated with firms' use of tax expense to meet or beat the consensus forecast.

3. Research design

We use the change in ETR from the third to fourth quarter to examine earnings management activity, following the research design in Dhaliwal et al. (2004). Specifically, we estimate the following regression as a baseline for our analysis:

$$ETR4\_ETR3_{it} = \beta_0 + \beta_1 DISP_{it} + \beta_2 MISS\_AMOUNT_{it} + \beta_3 DISP \times MISS\_AMOUNT_{it} + \beta_4 CONSENSUS\_CHG_{it} + \beta_5 INDUCED\_\Delta ETR_{it} + \beta_6 TAX\_OWED_{it} + \beta_7 ETR3_{it} + \beta_8 ACCRUALS_{it} + \beta_9 LNANALYSTS_{it} + \beta_{10} SPREAD_{it} + \beta_{11} EARN\_VOL_{it} + \beta_{12} FOREIGN_{it} + \beta_{13} ANALYST\_CHANGE_{it} + \beta_{14} LNAT_{it} + \beta_{15} Q4\_GUIDANCE_{it} + \beta_{16} LAG\_ETR4\_ETR3_{it} + FIXED\_EFFECTS + \varepsilon_{it} \quad (1a)$$

The dependent variable is the change in ETR from the 3rd fiscal quarter to the 4th fiscal quarter. We measure private information using analyst dispersion, *DISP*, which is equal to the standard deviation of the outstanding analyst EPS forecasts issued in the fourth quarter scaled by the mean estimate. We retain forecasts from the last quarter of the fiscal year to remove any stale earnings forecasts. *MISS_AMOUNT* is measured as the year-end earnings consensus estimate less the firm's earnings using its 3rd quarter ETR, and it captures the amount the firm would have missed the consensus analyst earnings forecast using the firm's 3rd quarter ETR. Consistent with Dhaliwal et al. (2004), we expect a negative coefficient on *MISS_AMOUNT*, indicating that firms decrease their ETR from 3rd to 4th quarter to a greater extent when they would have missed the consensus forecast using the 3rd quarter ETR. To test whether the association between *MISS_AMOUNT* and *ETR4_ETR3* varies by the level of dispersion, we interact *DISP* with *MISS_AMOUNT*.

Control variables follow Dhaliwal et al. (2004) and include *INDUCED_ΔETR* to control for changes in ETR caused by unexpected earnings, *TAX_OWED* to control for tax owed due to mis-estimation of tax liability in prior quarters, *ETR3* to control for underlying mean reversion of ETRs, and *ACCRUALS* to control for earnings management using accruals. In addition, we supplement the model by including *CONSENSUS_CHG* to control for a change in the annual consensus forecast from the third quarter to year end, *LNANALYSTS* to control for the number of analysts following the firm, *SPREAD* and *EARN_VOL* to control for market uncertainty, *FOREIGN* to identify firms with foreign income, *ANALYST_CHANGE* to control for differences

in the number of analysts that issue forecasts in the third quarter compared to only at year-end, *LNAT* to control for firm size, and *LAG_ETR4_ETR3* to control for the persistence of 3rd to 4th quarter ETR changes year to year. We also include *Q4_GUIDANCE*, a binary variable equal to one if management issues annual or fourth quarter earnings guidance during the fourth quarter, and zero otherwise. This variable addresses the possibility that the level of earnings management through the tax account could be affected by issuing earnings guidance in the last quarter of the year. Finally, we include year and industry fixed effects. All variable definitions are included in Appendix A.

We note that the level of dispersion in analysts' forecasts can occur for a variety of reasons, including general market uncertainty, and these reasons could also be associated with volatility in ETR changes. However, we do not expect this issue to inhibit our ability to draw inferences from our analysis because we are interested in *signed* changes in ETR from 3rd to 4th quarter (i.e., systematic increases or decreases) which are consistent with cookie jar or earnings management behavior and it is unlikely that general uncertainty would introduce bias to our analysis that causes directional changes in ETR.[10] We also include several controls for market uncertainty to further mitigate this concern.

To examine whether changes in analyst private information will affect manager's earnings management activity, we modify Equation (1a) as follows:

$$ETR4\_ETR3_{it} = \beta_0 + \beta_1 \Delta DISP_{it} + \beta_2 MISS\_AMOUNT_{it} + \beta_3 \Delta DISP \times MISS\_AMOUNT_{it} + \beta_k CONTROLS_{it} + FIXED\_EFFECTS + \varepsilon_{it} \quad (1b)$$

We measure *ΔDISP* as the difference in the dispersion of annual earnings forecasts at the

[10] In section 5.3 we test this assertion by interacting our proxies for general market uncertainty (bid-ask spread and earnings volatility) with *MISS_AMOUNT*. We find that the coefficients on these interactions are insignificant while the interaction with forecast dispersion is consistent with our main analyses, providing support that our main results are not driven by market uncertainty driving both analyst forecast dispersion and signed ETR changes.

end of the fiscal year and at the end of the third quarter. This variable captures the change in heterogeneity (and private information) among analysts during the last quarter of the fiscal year. The control variables are consistent with Equation (1a), and all variable definitions are included in Appendix A.

Importantly, because we have separate predictions for firms with pre-managed earnings that are above and below the consensus forecast (i.e., H1 and H2, respectively), we examine these groups of firms separately. Specifically, we examine firms with pre-managed earnings in excess of the consensus forecast using 3rd quarter ETR (i.e., *MISS*=0) and potentially have the ability to create a cookie jar reserve to test H1. We refer to firms in this subsample of firms as *BEAT* firms. For this analysis, we replace *MISS_AMOUNT* in Equations (1a) and (1b) with *BEAT_AMOUNT,* the amount by which the firm would have met or beat the consensus estimate using the third quarter ETR, as follows:

$$ETR4\_ETR3_{it} = \beta_0 + \beta_1 DISP_{it} + \beta_2 BEAT\_AMOUNT_{it} + \beta_3 DISP \times BEAT\_AMOUNT_{it} + \beta_k CONTROLS_{it} + FIXED\_EFFECTS + \varepsilon_{it} \quad (2a)$$

$$ETR4\_ETR3_{it} = \beta_0 + \beta_1 \Delta DISP_{it} + \beta_2 BEAT\_AMOUNT_{it} + \beta_3 \Delta DISP \times BEAT\_AMOUNT_{it} + \beta_k CONTROLS_{it} + FIXED\_EFFECTS + \varepsilon_{it} \quad (2b)$$

A positive coefficient on *BEAT_AMOUNT* suggests that, when *DISP* is zero, firms increase their ETR in the 4th quarter as the amount by which pre-managed earnings beats the consensus forecast increases, consistent with cookie jar behavior. H1 predicts a negative coefficient on β_3, consistent with reduced cookie jar behavior as forecast dispersion increases (or, inversely, more cookie jar behavior as forecast dispersion decreases).

To test H2, we estimate Equations (1a) and (1b) for firms with pre-managed earnings less than the consensus forecast using 3rd quarter ETR (i.e., *MISS* = 1). We refer to firms in this subsample as *MISS* firms. H2 predicts the sign of β_3 will be negative, suggesting firms are more

likely to decrease their ETR to meet or beat the consensus forecast as analyst private information increases.

4. Empirical results

4.1. Sample

The sample includes firm-year observations at the intersection of IBES and Compustat databases for the period 2000 to 2016. We obtain analysts' annual earnings forecasts from I/B/E/S and annual and quarterly financial statement data from Compustat. Management guidance data are obtained from Thomson Reuters. Consistent with prior research, we remove observations with negative pretax income or negative ETRs. We restrict our sample to observations where pre-managed earnings (earnings per share using on third quarter ETR) is within ten cents of the ending annual consensus forecasts. These restrictions are to ensure the observations in the sample are those likely to manage earnings and are reasonably close to the target so earnings management through tax expense is feasible. We require firms be followed by at least 3 analysts who issue annual earnings forecasts to meaningfully calculate earnings forecast dispersion. Finally, we require all regression variables for our analysis. We winsorize continuous variables at the 1st and 99th percentiles and omit influential observations with absolute values of studentized residuals greater than two to mitigate the effect of influential observations (Leone et al., 2017). The final sample for our main analysis includes 9,056 observations.[11] Table 1 provides a summary of our sample selection procedure.

[Insert Table 1 here]

4.2. Descriptive and univariate analyses

Table 2, Panel A presents descriptive statistics for the full sample. Consistent with prior

[11] Note that the number of influential observations varies by model specification, which results in variation in the number of observations included in the estimation.

research, the negative mean and median values for *ETR4_ETR3* suggests that firms, on average, decrease their ETR from 3rd to 4th quarter in our sample. The mean (median) value for *DISP* is 0.058 (0.021), suggesting the average standard deviation in forecasts is approximately 5.8 percent of the mean consensus value. The mean (median) *ΔDISP* is -0.014 (-0.007), which supports the notion that dispersion generally decreases as forecast horizon decreases. This is also consistent with increased public information about a firm's earnings as the fiscal year closes.

We partition our sample based on positive and negative earnings surprise that would have occurred using 3rd quarter ETR (*MISS*), and we provide mean variable values in Table 2, Panel B. *ETR4_ETR3* is negative for firms that would have missed the consensus using 3rd quarter ETR (*MISS* = 1) and for firms that would have met or beat the consensus (*MISS* = 0), and the test of difference in the mean value suggests firms that would have missed expectations decrease ETR to a greater extent.

[Insert Table 2 here]

Table 3 provides correlations between the variables used in our analysis for the full sample. Consistent with prior research, we find a negative and significant correlation between *ETR4_ETR3* and *MISS_AMOUNT*. The correlations between *ETR4_ETR3* and both *DISP* and *ΔDISP* are positive, suggesting that firms increase ETR as dispersion increases (or, conversely, decrease ETR as the earnings target precision increases).

[Insert Table 3 here]

Table 4, Panel A presents univariate evidence regarding differences in earnings management using tax expense for firms with high and low dispersion late in the year, where firms with high (low) dispersion are those above (below) the sample median value of *DISP*. The results indicate that firms with low forecast dispersion decrease their ETR from 3rd to 4th quarter

significantly more than firms covered by analysts with greater private information (p-value < 0.01). In addition, firms that experience a greater decrease in dispersion late in the year (i.e., earnings targets become more precise) decrease their ETR from 3rd to 4th quarter significantly more than other firms (p-value < 0.05).

Panel B of Table 4 provides additional univariate analyses of whether the dispersion of the target plays a role in attempted cookie jar or meet/beat behavior. Specifically, we identify firms with high and low dispersion, and we split our observations further based on the dichotomous variable *MISS.* For each group of observations, we determine and compare the proportion of observations with high and low dispersion in their forecast estimates that achieved a specified earnings result (e.g., increased ETR, meet or beat the consensus by one cent, or beat the consensus by three or more cents).

[Insert Table 4 here]

There are several important takeaways from Panel B of Table 4 regarding firms that would have missed the consensus forecast using 3rd quarter ETR (*MISS*=1). First, a higher proportion of firms with high forecast dispersion increased ETR in the fourth quarter relative to firms with low dispersion (42.2 percent versus 34.1 percent, *p*-value < 0.01). This result is consistent with firms with uncertain earnings targets capitulating on meeting the target, and instead, managing year-end ETRs upward (and earnings downward), potentially to create income reserves for future periods. Second, low forecast dispersion allows firms to more precisely meet or beat earnings benchmarks. A higher proportion of firms with low forecast dispersion ultimately met or beat earnings expectation by one cent relative to firms with high forecast dispersion (30.0 percent versus 18.5 percent, p-value < 0.01). Third, a higher proportion of firms with high forecast dispersion beat expectations by three or more cents relative to firms with low

forecast dispersion (23.8 percent versus 21.0 percent, p-value < 0.05). This result suggests that some firms with uncertain targets exceed the target by a few cents, potentially in an effort to ensure earnings meet expectations. Overall, the univariate tests in Table 4 Panel B suggest that firms with precise (certain) earnings targets are better able to meet their targets without an excessive reduction in ETRs.

We also present the proportions tests using firms who would have met or beat the year-end earnings consensus using 3rd quarter ETR in Table 4, Panel B. We find firms with more precise earnings targets are more likely to ultimately meet or beat the consensus forecast by 1 cent than firms with less precise targets (37.5 percent versus 25.8 percent, p-value < 0.01). Further, a higher proportion of firms with low forecast dispersion increase their ETR and meet or beat earnings expectations by one cent than other firms (16.4 percent versus 11.0 percent, p-value < 0.01). This latter result suggests that precision in the earnings target allows managers to precisely manipulate ETR without risking the negative consequences of missing market expectations. Finally, high forecast dispersion firms are more likely to beat earnings expectations by at least three cents than other firms, suggesting that firms with high forecast dispersion are more likely to overshoot the target. Combined, these univariate results suggest that managers effectively use tax account manipulation to meet or narrowly beat earnings expectations when the earnings target is precise. We next turn to multivariate analyses to control for additional factors that can affect changes in ETR from 3rd to 4th quarter.

4.3. Baseline multivariate results – full sample

Table 5 Columns (1) and (2) present the results of estimating Equation (1a) and (1b) for the full sample. The coefficient on *MISS_AMOUNT* is negative and significant in both Columns (p-values < 0.01 and 0.05, respectively), consistent with prior research and the expectation that

firms decrease ETR to manage earnings upward to meet the forecast consensus. In Column (1) we find that the coefficient on *DISP* is positive and significant (p-value < 0.01). This result suggests that, on average, firms with more precise or certain earnings benchmarks decrease their ETRs from 3rd to 4th quarter to a greater extent than firms with more disperse earnings benchmarks. The coefficient estimate for the interaction between *DISP* and *MISS_AMOUNT* is positive and significant (p-value < 0.01) suggesting that, conditional on *MISS_AMOUNT*, firms reduce their ETR to a greater extent for lower levels of dispersion after controlling for the main effect of both *DISP* and *MISS_AMOUNT*. Column (2) presents the results when including changes in dispersion from the end of the 3rd quarter to year-end (*ΔDISP*). The coefficient on the interaction between *ΔDISP* and *MISS_AMOUNT* is positive and significant (p-value < 0.01), suggesting that the association between the change in forecast dispersion and ETR change is positively associated with *MISS_AMOUNT*.

[Insert Table 5 here]

The results in Table 5 Columns (1) and (2) provide a baseline for our analyses, but it is important to note that these results are based on the full sample, which includes both *MISS* and *BEAT* firms. Based on the discussion in the previous section regarding the differing incentives when firms' pre-managed earnings are on either side of the earnings target, it is important to examine whether the results vary based on which side of the target the firm lands based on pre-managed earnings. Therefore, in the next section we contrast the regression results for the *MISS* and *BEAT* firms.

4.4. Comparing MISS and BEAT firms

Table 5 Columns (3) and (4) provide the results of estimating Equation (2a) and (2b) for the *BEAT* firms. Likewise, Columns (5) and (6) provides the results for estimating Equation (1a)

and (1b) the *MISS* firms. We begin by analyzing the *BEAT* firms. In Columns (3) and (4), the coefficient estimates for *BEAT_AMOUNT* are positive and significant (*p*-values < 0.01 and 0.10, respectively) indicating that as firms increase their fourth quarter ETR as they exceed the target to a greater extent. Likewise, the positive coefficient estimates for *DISP* and *ΔDISP* for *BEAT* firms in Columns (3) and (4) are positive and significant (*p*-values < 0.01 and 0.05, respectively) indicating that 4th quarter ETRs are also increasing with the dispersion (changes in dispersion) of analyst forecasts. Both of these results are consistent with cookie jar behavior. Regarding the interaction between *DISP* (or *ΔDISP*) and *BEAT_AMOUNT*, we expect that precise (less disperse) analyst forecasts will provide *BEAT* firms with a greater incentive to increase ETR to create cookie jar reserves. The estimated coefficients for the interactions (*DISP* * *BEAT_AMOUNT* and *ΔDISP* * *BEAT_AMOUNT*) are both negative and significant (p-values < 0.01). Overall, these results are consistent with the directional prediction of H1 indicating that analyst forecast dispersion is negatively associated with using tax expense to create cookie jar reserves.

In Columns (5) and (6) of Table 5 we present the regression estimates for *MISS* firms. We expect that, on average, *MISS* firms will reduce 4th quarter ETRs to meet or beat analysts' forecasts. However, the coefficient estimates on *MISS_AMOUNT* are statistically insignificant. In addition, the coefficient estimate for *DISP* is positive and significant (p-value<0.05), but the coefficient on *ΔDISP* is not statistically significant. Finally, the estimated coefficients for the interactions (*DISP* * *MISS_AMOUNT* and *ΔDISP* * *MISS_AMOUNT*) are both positive, but only the interaction with *ΔDISP* is statistically significant (p-value<0.10). Hence, it appears that the effect of dispersion is primarily concentrated in the *BEAT* firms (i.e., those firms that have the incentive to create cookie jar reserves).

To test whether the association is stronger for *MISS* firms compared to *BEAT* firms, we test the coefficient estimate on the interaction term across equations. We find that the absolute value of the coefficient on the interaction between *DISP* and *BEAT_AMOUNT* in Column (3) is significantly greater than the coefficient on the interaction between *DISP* and *MISS_AMOUNT* in Column (5) (p-value < 0.05). Similarly, we find that the absolute value of the coefficient on the interaction between Δ*DISP* and *BEAT_AMOUNT* is significantly greater than the coefficient on the interaction between Δ*DISP* and *MISS_AMOUNT* (p-value < 0.10). Thus, this evidence suggests the association between analyst forecast dispersion and cookie jar behavior is stronger than the association between analyst forecast dispersion and meet or beat behavior. That is, analyst forecast dispersion is more likely to result in cookie jar behavior than meet or beat behavior, consistent with the differing incentives when pre-managed earnings are on either side of the consensus forecast.

Figure 2 provides conditional slope plots as a visual representation of the results in Table 5.[12] In Panel A, the conditional slope on *BEAT_AMOUNT* for *BEAT* firms is positive for low levels of analyst forecast dispersion, as represented by the positive values of the slope when *DISP* is low. This means that firms *increase* their ETRs from the 3rd to 4th quarter when they are above the target and analyst forecast dispersion is low. However, as dispersion increases the conditional slope on *BEAT_AMOUNT* also decreases. This result indicates that firms are less likely to create cookie jars as dispersion increases, consistent with H1. The 95% confidence bands indicate that the conditional slope on *BEAT_AMOUNT* is positive and significant when *DISP* is low, providing evidence of cookie jar activity when the earnings target is precise.

The conditional slope plot also shows that the association between *BEAT_AMOUNT* and

[12] Burks et al. (2018) provide guidance on the use of conditional slope plots to facilitate interpretation of interactions in accounting research.

ETR4_ETR3 is negative and significant for high levels of forecast dispersion. This result provides additional insight into the association between forecast dispersion and earnings management, and firms significantly *decrease* their ETRs (and increase earnings) when dispersion is high even when pre-managed earnings are above the consensus target. This evidence is consistent with the incentive to increase earnings to meet or beat a higher percentage of forecasts because, even though pre-managed earnings are above the consensus target, firms still decrease their ETR to meet the expectations of other analysts (i.e., the analyst forecasts that are above the consensus). As shown in Panel B, among *MISS* firms, the conditional slope on *MISS_AMOUNT* does not vary with *DISP*.

The results presented in Table 5 and Figure 2 provide an important insight regarding earnings management behavior. Prior studies have interpreted results, such as those in Table 5 Columns (1) and (2), as evidence of income-increasing earnings management and an absence of income decreasing earnings management (i.e., creating cookie jar reserves). However, this interpretation uses *BEAT* firms as a reference category when examining meet or beat activity and implicitly assumes *BEAT* firms do not increase ETR to create cookie jar reserves. The results in Columns (3) through (6) suggest that the tax expense manipulation effect is driven by firms that would have beat expectations because they increase ETR from 3rd to 4th quarter, potentially in an attempt to create reserves for future periods. Because firms with pre-managed earnings that beat the consensus have incentives to increase ETR from 3rd to 4th quarter, the relative decrease in ETR from 3rd to 4th quarter for firms that would miss could be overstated. Further, the results in Table 5 are consistent with our hypotheses and suggest that dispersion is associated with a significant reduction in cookie jar behavior, but no significant association with meet or beat behavior.

5. Supplemental tests

5.1. Nonlinear effect of dispersion

In section 2.2 we discussed our prediction regarding how analyst forecast dispersion would likely reduce cookie jar behavior and described the tension around how analyst forecast dispersion could induce more or less income-increasing behavior. An important consideration for each of these predictions is how much ETR manipulation is needed to accomplish the managers' earnings goals (i.e., how far pre-managed earnings are from the target). For example, on the cookie jar side, we expect that dispersion will have a stronger deterrent effect when pre-managed earnings are close to the benchmark (i.e., *BEAT_AMOUNT* is smaller) because firms are less able to create reserves without disappointing some analysts. Likewise, when pre-managed earnings are significantly above the benchmark, dispersion likely does not deter cookie jar activity to the same extent because these firms are better able to reduce earnings without the risk of disappointing analysts. In contrast, we expect that dispersion will likely increase meet or beat behavior when pre-managed earnings are close to the target (i.e., *MISS_AMOUNT* is smaller) because firms have an incentive to meet a larger percentage of forecasts. Moreover, it is likely less costly to increase earnings when the firm is closer to the forecasts than when it is further away from the forecasts and they need to manage ETRs to a greater extent.

Based on this discussion, we examine whether analyst forecast dispersion has a different effect on meet or beat activity (cookie jar activity) conditional on the magnitude of *MISS_AMOUNT* (*BEAT_AMOUNT*). That is, we test for a nonlinear effect of dispersion by interacting *DISP* with *MISS_AMOUNT* and *BEAT_AMOUNT* cubed.[13] Table 6 presents the results of this analysis. In Column (1) of Table 6, for *BEAT* firms, we find that the coefficient on

[13] We use a cubed term rather than a squared term in order to preserve the direction of the interaction (income increasing or decreasing).

interaction between *DISP* and *BEAT_AMOUNT* is negative and significant (p-value < 0.05), consistent with our primary analyses. However, we find that the coefficient on the interaction between *DISP* and *BEAT_AMOUNT^3* is positive and significant (p-value < 0.10) providing support for our contention that dispersion will discourage cookie jar behavior to a lesser extent as *BEAT_AMOUNT* is larger.

In Column (2), for *MISS* firms, we find that the coefficient on *DISP* and *MISS_AMOUNT* is negative and significant (p-value < 0.01). This result suggests that dispersion is associated with an increase meet or beat activity through reducing ETR from 3rd to 4th quarter, consistent with the incentive to meet a greater number of forecasts. However, we find that the coefficient on *DISP* and *MISS_AMOUNT^3* is positive and significant (p-value < 0.01), consistent with the notion that as firms are further from the forecasts (i.e., *MISS_AMOUNT* is larger), firms are less likely to manage earnings in an attempt to meet or beat the targets. To provide some intuition around this result, we take the partial derivative with respect to *DISP* and find that the association between ETR changes and dispersion is negative until *MISS_AMOUNT* is approximately 0.052, at which point the association is positive (and potentially suggests "big bath" behavior). This estimation suggests that dispersion is associated with increased earnings management to meet or beat until *MISS_AMOUNT* is greater than five cents.

[Insert Table 6 here]

Overall, the results in Table 6 provide support for the notion that dispersion has differing associations with earnings management activity, contingent on the distance between pre-managed earnings and the consensus forecast. Further, Table 6 provides additional insight into the insignificant primary results for *MISS* firms: dispersion is associated with earnings-increasing (i.e., meet or beat) earnings management behavior when pre-managed earnings is near the

consensus, but earnings-decreasing (i.e., big bath) earnings management behavior when further from the consensus.

5.2. Management guidance

In our previous regressions, we include a binary variable representing whether management issues earnings guidance during the fourth quarter of the fiscal year. Earnings guidance represents a potential confound because management issued guidance is a valuable voluntary disclosure that analysts use to develop their forecasts. Regulators and investors are often concerned that earnings guidance can drive short-termism and motivate managers to engage in myopic behavior around their self-imposed earnings targets (Levitt 2000; Hirst et al. 2008; Huston et al. 2010; Almedia 2018). Indeed, Kasznik (1999) finds that firms manage earnings upward to meet their own earnings forecasts, and Aboody and Kasnik (2000) provide evidence that CEOs manage investor expectations around stock option award dates. Additionally, Cheng et al. (2005) find that firms consistently issuing earnings guidance invest in significantly less R&D than firms that do not consistently issue guidance, and that firms that consistently provide guidance meet or beat analysts' forecasts more frequently. Taken together, prior research suggests that firms that issue guidance are more likely to engage in earnings management activity. In the context of our study, we expect our results to be strongest among firms that issue earnings guidance because they are likely more concerned about managing earnings around expectations.

To more fully investigate the effects of earnings guidance, we divide our sample into subsamples of firms that issue earnings guidance in the 4^{th} quarter and firms that do not issue guidance at all. We then estimate our regressions separately for each of these subsamples. The results of these regressions are presented in Table 7 where Panel A presents the results for the

firm-years with guidance in the 4th quarter and Panel B presents the results for the firm-years with no guidance.

[Insert Table 7 here]

Table 7 indicates that dispersion is primarily associated with ETR adjustment for the subsample of firms that issue guidance. Specifically, the interaction between *DISP* and *BEAT_AMOUNT* for meet firms is only significant for firms that provide guidance in the 4th quarter. Consistent with our main analyses, the interaction between *DISP* and *MISS_AMOUNT* is not significant for firms that provide guidance or those that do not. The pattern of results in Table 7 are consistent with the notion that firms issuing earnings guidance appear more interested in creating cookie jar reserves.

5.3 General market uncertainty

It is possible that analyst forecast dispersion is associated with general market uncertainty, and market uncertainty could also be correlated with volatility in ETR changes. Although we do not expect general market uncertainty to be associated with *signed* ETR changes, our results could be affected to the extent that general uncertainty biases ETR changes in a particular direction. To mitigate the concern that our results are a byproduct of the associations with general market uncertainty and our variables of interest (ETR changes and analyst forecast dispersion), we amend Equation (1a) by including an interaction between *MISS_AMOUNT* and two proxies for general uncertainty, bid-ask spread (*SPREAD*) and earnings volatility (*EARN_VOL*). In both regressions (untabulated), we find that the coefficients on the interactions between *MISS_AMOUNT* and *SPREAD* as well as *MISS_AMOUNT* and *EARN_VOL* are not significantly different from zero (p-values > 0.10), while the coefficient on the interaction between *MISS_AMOUNT* and *DISP* is positive and significant (p-value < 0.01), consistent with

our primary analyses. These results are not consistent with the alternative explanation that general market uncertainty driving both analyst forecast dispersion and ETR changes.

6. Conclusion

This study investigates whether the extent of earnings management depends on the manager's perception of private information in analyst forecasts within the consensus estimate. Specifically, we examine the extent to which dispersion in analysts' forecasts affects firms' attempts to manage earnings to 1) decrease earnings and create cookie jar reserves or 2) increase earnings to meet or beat the consensus forecast.

Following the design in prior research (e.g., Dhaliwal et al. 2004), we use effective tax rate changes from the 3rd to 4th quarter to examine whether systematic decreases (increases) in ETR are indicative of earnings management (to meet or beat the target or create cookie jar reserves) behavior. It is important to our research question to examine the association between analyst forecasts dispersion and both earnings management to meet or beat the target, as well as cookie jar behavior. Thus, we examine how firms change their ETR on when their pre-managed earnings are on each side of the target consensus. That is, we examine firms that would have beat the consensus using 3rd quarter ETR (potential cookie jar firms) as well as firms that would have missed the analyst consensus forecast using 3rd quarter ETR (potential meet or beat firms).

Our results indicate that firms engage in cookie jar behavior when analyst forecast dispersion is low but do so to a lesser extent as forecast dispersion increases. Specifically, when firms' 3rd quarter ETR would have allowed them meet or beat the consensus analyst forecast, they increase their ETR in the 4th quarter, which is indicative of cookie jar behavior. However, this cookie jar behavior decreases with the extent of forecast dispersion. In fact, we provide evidence that when dispersion is large enough, firms decrease their ETR (and increase earnings)

even though their pre-managed earnings are above the consensus forecast. On the other side of the target, when firms would have missed the consensus analyst forecast without a change from 3rd quarter ETR, we do not find a significant association between analyst forecast dispersion and ETR decreases. Collectively, this study contributes to the earnings management literature by documenting evidence of a previously unexplored but important determinant of earnings management activity and provides new insight regarding why and under what circumstances firms decide to manage earnings.

References

Aboody, D. and R. Kasznik. CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting & Economics* 29: 73-100.

Almedia, H. 2018. Is it time to get rid of earnings-per-share (EPS)? Working Paper, University of Illinois at Urbana Champaign.

Barron, O., O. Kim, S. Lim, and D. Stevens. 1998. Using analysts' forecasts to measure properties of analysts' information environment. *The Accounting Review* 73 (4): 421-433.

Barth, M., Elliott, J., Finn, M., 1999. Market rewards associated with patterns of increasing earnings. *Journal of Accounting Research* 32 (2): 387-413.

Bartov, E., D. Givoly, and C. Hayn. 2002. The Rewards to Meeting or Beating Earnings Expectations. *Journal of Accounting and Economics* 33: 173-204.

Beaver, W., McNichols, M., Nelson, K., 2007. An alternative interpretation of the discontinuity in earnings distributions. *Review of Accounting Studies* 12: 525–556.

Burgstahler, D., Dichev, I., 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24, 99–126.

Burgstahler, D., Eames, M., 2006. Management of earnings and analysts' forecasts to achieve zero and small positive earnings surprises. *Journal of Business Finance & Accounting* 33(5-6): 633-652.

Burks, J., D. Randolph, and J. Seida. 2018. Modeling and interpreting interactions in accounting tradeoff research. *Journal of Accounting Literature*, forthcoming.

Bratten, B., C. A. Gleason, S. A. Larocque, and L. F. Mills. 2017. Forecasting Taxes: New Evidence from Analysts. *The Accounting Review* 92 (3): 1-29.

Brown, L. D. 1991. Forecast selection when all forecasts are not equally recent. *International Journal of Forecasting* 7: 349–356.

Brown, L. D., and M. L. Caylor 2005. A Temporal Analysis of Quarterly Earnings Thresholds: Propensities and Valuation Consequences. *The Accounting Review* 80 (2): 423-440.

Cheng, M., K. R. Subramanyam, and Y. Zhang. 2005. Earnings guidance and managerial myopia. Working paper, University of Southern California.

Christensen, B. E., A. J. Olson, and T. C. Omer. 2015. The Role of Audit Firm Expertise and Knowledge Spillover in Mitigating Earnings Management through the Tax Accounts. *Journal of the American Taxation Association* 37 (1): 3-36.

Clement, M. 1999. Analyst forecast accuracy: Do ability, resources, and portfolio complexity matter? *Journal of Accounting and Economics* 27 (3): 285–303.

Clement, M., and S. Tse. 2003. Do investors respond to analysts' forecast revisions as if forecast accuracy is all that matters? *The Accounting Review* 78 (1): 227–249.

Clement, M., and S. Tse. 2005. Financial analyst characteristics and herding behavior in forecasting. *The Journal of Finance* 60 (1): 307-341.

Comprix, J., L. F. Mills, and A. P. Schmidt. 2012. Bias in Quarterly Estimates of Annual Effective Tax Rates and Earnings Management. *Journal of the American Taxation Association* 34 (1): 31-53.

Cook, K. A., G. R. Huston, and T. C. Omer. 2008. Earnings Management through Effective Tax Rates: The Effects of Tax-Planning Investment and the Sarbanes-Oxley Act of 2002. *Contemporary Accounting Research* 25 (2): 447-471.

DeAngelo, H., DeAngelo, L., Skinner, D., 1996. Reversal of fortune: Dividend policy and the disappearance of sustained earnings growth. *Journal of Financial Economics* 40 (3): 341-371.

Dechow, P. M., S. A. Richardson, and I. Tuna. 2003. Why Are Earnings Kinky? An Examination of the Earnings Management Explanation. *Review of Accounting Studies* 8: 355-384.

Dechow, P., W. Ge, and C. Schrand. 2010. Understanding Earnings Quality: A Review of the Proxies, Their Determinants and Their Consequences. *Journal of Accounting and Economics* 50: 344-401.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings Management to Exceed Thresholds. *Journal of Business* 72 (1): 1-33.

Dhaliwal, D. S., C. A. Gleason, and L. F. Mills. 2004. Last-Chance Earnings Management: Using the Tax Expense to Meet Analysts' Forecasts. *Contemporary Accounting Research* 21 (2): 431-459.

Durtschi, C., Easton, P., 2005. Earnings management? The shapes of the frequency distributions of earnings metrics are not evidence ipso facto. *Journal of Accounting Research* 43, 557–592.

Durtschi, C., Easton, P., 2009. Earnings management? Erroneous inference based on earnings frequency distributions. *Journal of Accounting Research* 47 (2009), 1249–1282.

Gleason, C. A., and L. F. Mills. 2008. Evidence of Differing Market Responses to Beating Analysts' Targets Through Tax Expense Decreases. *Review of Accounting Studies* 13: 295-318.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40: 3-73.

Graham, J. R., J. S. Raedy, and D. A. Shackelford. 2012. Research in accounting for income taxes. *Journal of Accounting and Economics* 53: 412-434.

Habib, A., and J. C. Hansen. 2008. Target Shooting: Review of Earnings Management Around Earnings Benchmarks. *Journal of Accounting Literature* 27: 25-70.

Hayn, C., 1995. The information content of losses. *Journal of Accounting and Economics* 20, 125–153.

Healy, P. M. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7: 85-107.

Healy, P. M., and J. M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (4): 365-383.

Hirst, D., L. Koonce, and S. Venkataraman. 2008. Management earnings forecasts: A review and framework. *Accounting Horizons* 22 (3): 315-338.

Holthausen, R. W., and R. E. Verrecchia. 1990. The effect of informedness and consensus on price and volume behavior. *The Accounting Review* 65 (1): 191-208.

Houston, J., B. Lev, and J. Tucker. 2010. To guide or not to guide? Causes and consequences of stopping quarterly earnings guidance. *Contemporary Accounting Research* 27 (1): 143-185.

Jacob, J., T. Lys, and M. Neale. 1999. Expertise in forecasting performance of security analysts. *Journal of Accounting and Economics* 28 (1): 51–82.

Jiang, J., 2008. Beating earnings benchmarks and the cost of debt. *The Accounting Review* 83 (2): 377-416.

Kasznik, R. 1999. On the association between voluntary disclosure and earnings management. *Journal of Accounting Research* 37 (1): 57-81.

Kasznik, R., and M. F. McNichols. 2002. Does Meeting Earnings Expectations Matter? Evidence from Analyst Forecast Revisions and Share Prices. *Journal of Accounting Research* 40 (3): 727-759.

Kim, O., S. C. Lim, and K. W. Shaw. 2001. The inefficiency of the mean analyst forecast as a summary forecast of earnings. *Journal of Accounting Research* 39 (2): 329–335.

Kirschenheiter, M., and N. D. Melumad. 2002. Can "big bath" and earnings smoothing co-exist as equilibrium financial reporting strategies? *Journal of Accounting Research* 40 (3): 761-796.

Kirk, M. P., D. A. Reppenhagen, and J. W. Tucker. 2014. Meeting Individual Analyst Expectations. *The Accounting Review* 89 (6): 2203-2231.

Leone, A., M. Minutti-Meza, and C. Wasley. 2017. Influential observations and inference in accounting research. Working paper, University of Miami and University of Rochester.

Levine, M. 2019. Taking the gold out of Goldman Sachs. *Bloomberg,* February 6, 2019. Available at: https://www.bloomberg.com/opinion/articles/2019-02-06/taking-the-gold-out-of-goldman-sachs

Levitt, A. 2000. Renewing the covenant with investors. Speech at the Center of Law and Business, New York University. May 26.

Matsumoto, D. 2002. Management's Incentives to Avoid Negative Earnings Surprises. *The Accounting Review* 77 (3): 483-514.

Matsunaga, S., Park, C., 2001. The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *The Accounting Review* 76 (3): 313-332.

Mikhail, M., B. Walther, and R. Willis. 1997. Do security analysts improve their performance with experience? *Journal of Accounting Research* 35 (Supplement): 131–157.

Myers, J., Myers, L., Skinner, D., 2007. Earnings momentum and earnings management. *Journal of Accounting, Auditing & Finance* 22 (2): 249-284.

O'Brien, P. 1988. Analysts' forecasts as earnings expectations. *Journal of Accounting and Economics* 10 (1): 53–83.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42: 335–370.

Stickel, S. 1992. Reputation and performance among security analysts. *Journal of Finance* 47 (5): 1811–1836.

Appendix A: Variable Definitions (alphabetical order)	
Variable	**Definition**
ACCRUALS	Total accruals scaled by pre-tax book income, as specified by Dhaliwal et al. (2004).
ANALYST_CHANGE	Equal to the change in the number of analysts issuing annual earnings forecast in the fourth and third fiscal quarters.
BEAT_AMOUNT	The amount the firm would have beat the consensus analyst earnings forecast using the firm's effective tax rate from the third quarter, measured as the consensus analyst forecast minus pretax income times 1 minus *ETR3* divided by common shares used to calculate EPS.
CLEAN	An indicator variable equal to one if the third quarter GAAP ETR is within one-half percentage point of the implied I/B/E/S actual quarterly ETR (Bratten et al. 2017)
CONSENSUS_CHG	Equal to the difference in the mean annual earnings forecast as of the end of the fiscal year and as of the end of the third quarter.
DISP	Standard deviation in analysts' earnings forecasts at the end of the fiscal year, scaled by the mean consensus estimate. We retain only forecasts from the last quarter of the fiscal year to remove any stale earnings forecasts.
ΔDISP	Equal to *DISP* minus the standard deviation in outstanding analyst annual earnings forecasts at the end of the third quarter, scaled by the mean consensus estimate at the end of the third quarter.
EARN_VOL	Earnings volatility, measured as the five-year standard deviation of earnings before interest and taxes scaled by total assets.
ETR3	The firm's ETR in the 3rd quarter, measured as the sum of income taxes from the 1st through the 3rd quarter, divided by the sum of pretax income from the 1st through the 3rd quarter.
ETR4_ETR3	Change in the firm's ETR from 3rd to 4th quarter, measured as the 4th quarter ETR minus the 3rd quarter ETR.
FOREIGN	Indicator variable equal to one if the firm reported foreign income in the prior year, zero otherwise.
INDUCED_ΔETR	The change in total tax expense due to the difference between actual earnings per share and the consensus forecast divided by pretax income. Calculated as the statutory tax rate (0.35 for our sample) minus *ETR3* times the difference between actual earnings per share and the consensus analyst forecast times common shares used to calculated EPS divided by 1 minus the statutory tax rate (0.35) all divided by pretax income.
LAG_ETR4_ETR3	Equal to the firm's *ETR4_ETR3* in the prior year
LNANALYSTS	Natural log of the number of analysts providing earnings forecasts.
LNAT	Natural log of total assets for the firm.
MB	An indicator variable equal to one if the firm's actual earnings meet or beat the mean earnings forecast consensus.

MISS	An indicator variable equal to one if *MISS_AMOUNT* is greater than zero, and zero otherwise.
MISS_AMOUNT	The amount the firm would have missed the consensus analyst earnings forecast using the firm's effective tax rate from the third quarter, measured as the consensus analyst forecast minus pretax income times 1 minus *ETR3* divided by common shares used to calculate EPS.
Q4_GUIDANCE	Equal to one if firm management issues guidance on annual or 4th quarter earnings in the 4th quarter, and zero otherwise.
SPREAD	Bid-ask spread, equal to the bid-ask spread scaled by the stock price at the end of the fiscal year.
TAX_OWED	Taxes payable minus tax refund receivable divided by pretax income.

Figure 1
Illustration of analyst forecast dispersion and earnings management decision.

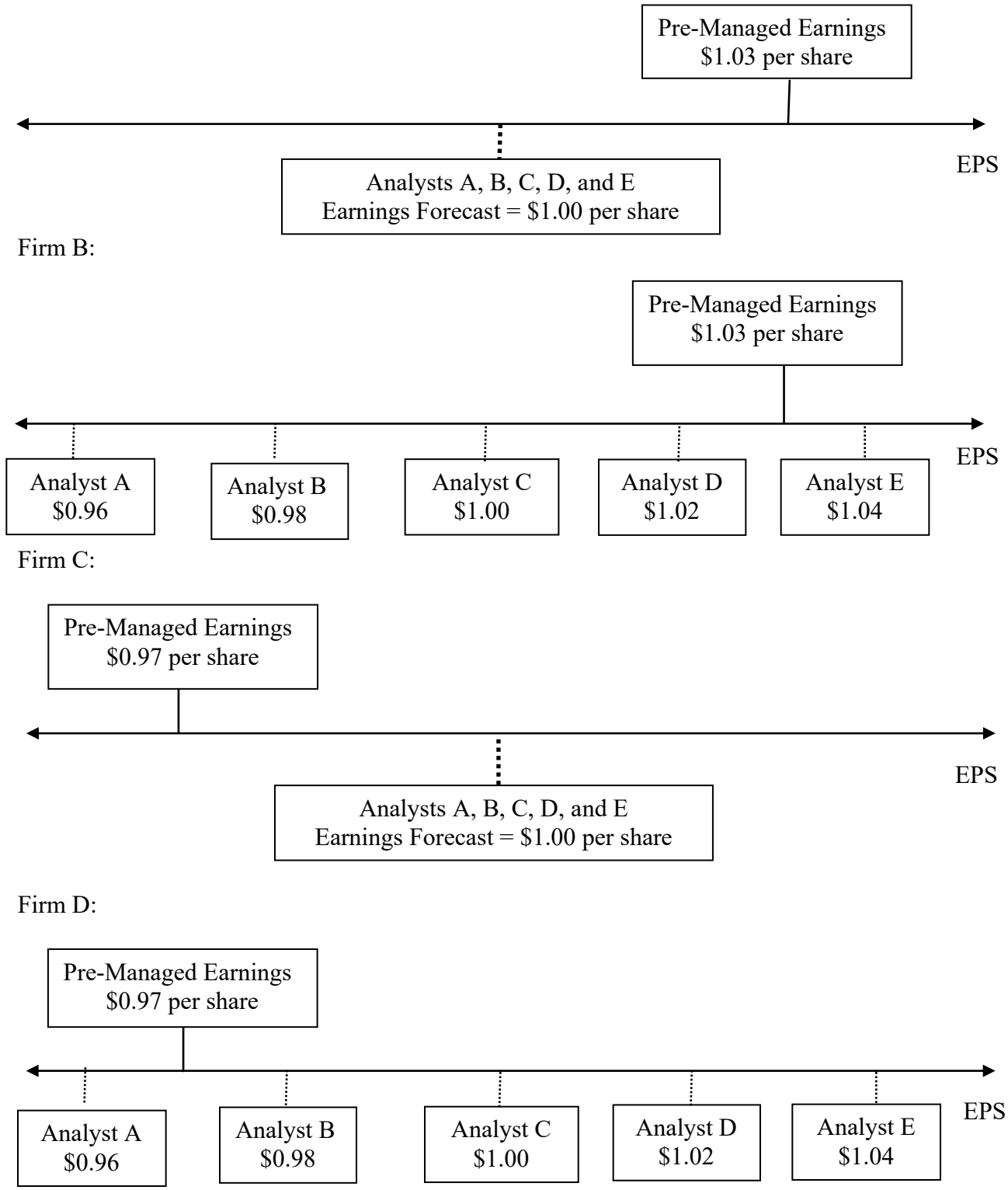
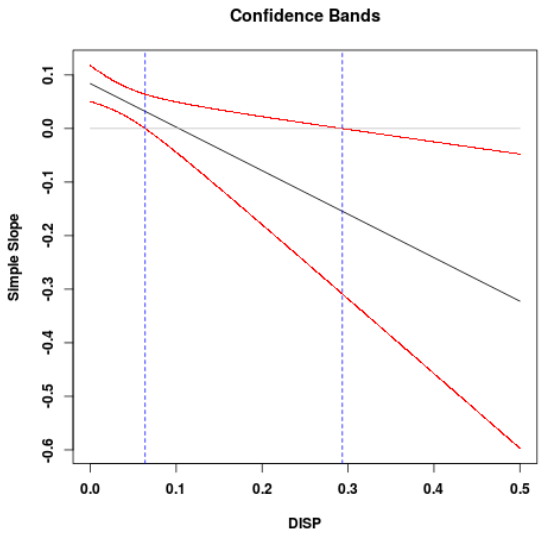


Figure 2
Conditional slope plots.

Panel A: Conditional slope and confidence bands for regression coefficient estimate on *BEAT_AMOUNT* conditional on *DISP*



Panel B: Conditional slope and confidence bands for regression coefficient estimate on *MISS_AMOUNT* conditional on *DISP*

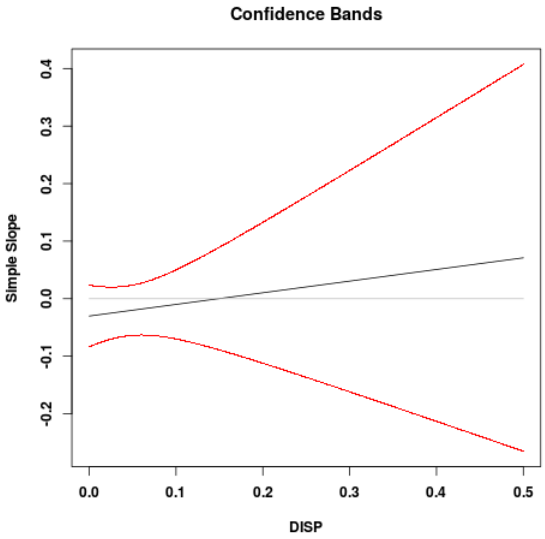


Fig. 2. Graphs show conditional slopes for the association between ETR changes and *BEAT_AMOUNT* (Panel A) and *MISS_AMOUNT* (Panel B). The slope is not statistically significant from zero where the 95% confidence bands, represented by the red lines, straddle positive and negative conditional slope values. The vertical blue lines indicate the level of *DISP* at which the slope is statistically significant at the 95% level.

Table 1
Sample Selection.

	Firm-year observations
Observations from Compustat 2000 - 2016	97,753
Less:	
Observations missing I/B/E/S data	(15,635)
Observations with fewer than three analysts following	(26,740)
Observations with negative pretax income or tax expense	(17,532)
Observations with fewer than $10 million in assets	(7)
Observations missing data for regression variables	(6,656)
Observations with *MISS_AMOUNT* +/- $0.10	(21,260)
Observations with absolute value of studentized residuals greater than two	(867)
Full Sample	9,056

Table 2
Descriptive Statistics.

Panel A: Full Sample (n=9,056)

Variable	Mean	Std. Dev.	25th Pct.	Median	75th Pct.
ETR4_ETR3	-0.002	0.036	-0.009	-0.001	0.004
DISP	0.058	0.124	0.010	0.021	0.052
ΔDISP	-0.014	0.122	-0.025	-0.007	0.003
MISS	0.408	0.491	0.000	0.000	1.000
MISS_AMOUNT	-0.008	0.050	-0.047	-0.012	0.028
CONSENSUS_CHG	-0.010	0.110	-0.047	0.000	0.036
INDUCED_ΔETR	0.000	0.058	-0.001	0.000	0.002
TAX_OWED	0.049	0.138	0.000	0.002	0.073
ETR3	0.306	0.123	0.270	0.349	0.382
ACCRUALS	-0.714	1.532	-0.903	-0.415	-0.130
LNANALYSTS	2.204	0.678	1.609	2.197	2.708
SPREAD	0.003	0.006	0.000	0.001	0.003
EARN_VOL	0.054	0.069	0.017	0.032	0.062
FOREIGN	0.485	0.500	0.000	0.000	1.000
ANALYST_CHANGE	0.751	1.014	0.000	0.000	1.000
LNAT	6.921	1.635	5.709	6.745	7.907
Q4_GUIDANCE	0.598	0.490	0.000	1.000	1.000
LAG_ETR4_ETR3	-0.028	0.372	-0.012	0.000	0.004

Panel B: Sample Means for the *MISS* subsample (n=3,695) and *BEAT* subsample (n=5,361)

Variable	*MISS*	*BEAT*	Difference	T-Stat	P-Value
ETR4_ETR3	-0.004	-0.001	-0.003	4.048	0.000
DISP	0.067	0.051	0.016	6.287	0.000
ΔDISP	-0.012	-0.016	0.004	1.452	0.146
MISS_AMOUNT	0.042				
BEAT_AMOUNT		0.043			
CONSENSUS_CHG	-0.020	-0.004	-0.016	6.724	0.000
INDUCED_ΔETR	-0.003	0.002	-0.005	3.425	0.001
TAX_OWED	0.051	0.048	0.003	1.332	0.183
ETR3	0.307	0.305	0.002	0.620	0.535
ACCRUALS	-0.835	-0.630	-0.205	6.254	0.000
LNANALYSTS	2.185	2.216	-0.031	2.126	0.034
SPREAD	0.003	0.003	0.000	0.041	0.967
EARN_VOL	0.052	0.056	-0.004	2.376	0.018
FOREIGN	0.507	0.470	0.037	3.414	0.001
ANALYST_CHANGE	0.707	0.781	-0.074	3.389	0.007
LNAT	6.944	6.905	0.039	1.114	0.265
Q4_GUIDANCE	0.587	0.605	-0.018	1.752	0.798
LAG_ETR4_ETR3	-0.027	-0.028	0.001	0.123	0.902

This table presents descriptive statistics for the full sample (Panel A), as well as descriptive statistics for *MISS* firms (*MISS* = 1) and *BEAT* firms (*MISS* = 0) in Panel B. All continuous variables are winsorized at the 1% level. Appendix A provides all variable definitions.

Table 3
Correlations.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	*ETR4_ETR3*																	
(2)	*DISP*	**0.20**																
(3)	*ΔDISP*	**0.04**	**0.31**															
(4)	*MISS_AMOUNT*	**-0.05**	**0.06**	0.01														
(5)	*CONSENSUS_CHG*	**-0.03**	**-0.06**	**-0.04**	**-0.08**													
(6)	*INDUCED_ΔETR*	**0.05**	**-0.05**	0.01	**-0.04**	**0.08**												
(7)	*TAX_OWED*	**0.05**	**0.05**	**0.02**	0.01	0.02	0.00											
(8)	*ETR3*	**-0.15**	**-0.14**	0.01	**0.02**	**-0.04**	**0.06**	-0.01										
(9)	*ACCRUALS*	**-0.26**	**-0.38**	**0.04**	**-0.07**	**0.06**	**0.03**	**-0.04**	-0.02									
(10)	*LNANALYSTS*	-0.01	**-0.09**	**0.03**	-0.01	0.01	0.00	**0.04**	**0.05**	**0.05**								
(11)	*SPREAD*	0.00	**0.04**	-0.01	0.00	**-0.06**	0.00	**0.02**	**0.05**	**-0.04**	**-0.22**							
(12)	*EARN_VOL*	**0.02**	**0.11**	**-0.04**	**-0.02**	**0.03**	**0.05**	0.01	**-0.13**	**0.03**	**-0.09**	**0.05**						
(13)	*FOREIGNINC*	**-0.03**	**-0.08**	0.00	**0.04**	**0.03**	**0.02**	**0.16**	-0.02	**0.07**	**0.14**	**-0.10**	**-0.06**					
(14)	*ANALYST_CHG*	0.00	-0.01	0.02	**-0.04**	**0.03**	0.01	**0.04**	-0.02	**0.04**	**0.38**	**-0.05**	**0.05**	**0.03**				
(15)	*LNAT*	0.00	**-0.06**	**0.03**	0.01	0.00	**-0.04**	**0.04**	**-0.02**	**-0.05**	**0.59**	**-0.20**	**-0.35**	**0.16**	**0.18**			
(16)	*Q4_GUIDANCE*	0.00	**-0.08**	**0.03**	-0.02	0.01	0.02	**0.06**	**0.04**	**0.06**	**0.19**	**-0.10**	**-0.05**	**0.18**	**0.03**	**0.04**		
(17)	*LAG_ETR4_ETR3*	0.01	**-0.04**	-0.02	0.00	0.00	0.00	**-0.03**	**-0.05**	**0.04**	**0.03**	0.00	**-0.03**	-0.01	0.02	**0.03**	0.00	

This table presents the Pearson Correlations between the variables in the analysis for the full sample (n=9,056). All continuous variables are winsorized at the 1% and 99% levels. Bold values indicate significance at $p < 0.05$ or better. Appendix A provides variable definitions.

Table 4
Univariate Analyses.

Panel A: ETR Changes (*ETR4_ETR3*) by Level of Analyst Forecast Dispersion

Full Sample	High	Low	Difference	t-statistic	p-value
DISP	-0.001	**-0.003**	0.002	3.133	0.002
ΔDISP	-0.002	**-0.003**	0.001	2.309	0.021
MISS=0 Firms					
DISP	-0.003	**-0.006**	0.002	2.015	0.044
ΔDISP	-0.002	**-0.006**	0.004	3.056	0.002
MISS=1 Firms					
DISP	0.000	**-0.002**	0.002	3.138	0.002
ΔDISP	-0.001	**-0.001**	0.000	0.298	0.766

Panel B: Proportions Tests

MISS firms Actual Result	High Disp	Low Disp	Difference	T-statistic	p-value
Increase ETR	**0.422**	0.341	0.081	5.251	0.000
Meet/Beat by 1 cent	0.185	**0.300**	-0.115	8.814	0.000
Beat - 3+ cents	**0.238**	0.210	0.027	2.118	0.034
BEAT firms Actual Result	High Disp	Low Disp	Difference	T-statistic	p-value
Increase ETR	0.510	**0.580**	-0.070	4.834	0.000
Meet/Beat by 1 cent	0.258	**0.375**	-0.117	8.713	0.000
Beat - 3+ cents	**0.365**	0.283	0.082	6.099	0.000
Increase ETR & Meet/Beat by 1 cent	0.110	**0.164**	-0.054	5.336	0.000

High (low) dispersion firms are defined as firms above (below) the median value of *DISP* or *ΔDISP*. Bolded values indicate the larger value for that row between high dispersion and low dispersion observations.

Table 5
ETR Management and Analyst Forecast Dispersion – Full Sample, *BEAT* Firms, and *MISS* Firms.

DV = *ETR4_ETR3*	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Full Sample	Full Sample	*BEAT* firms	*BEAT* firms	*MISS* firms	*MISS* firms
DISP	0.032***		0.053***		0.043**	
	(4.542)		(2.973)		(2.080)	
ΔDISP		0.037*		0.035**		0.023
		(1.912)		(2.188)		(1.120)
BEAT_AMOUNT			0.084***	0.028*		
			(4.887)	(1.749)		
DISP * BEAT_AMOUNT			**-0.813*** **			
			(-2.713)			
ΔDISP * BEAT_AMOUNT				**-0.953*** **		
				(-3.349)		
MISS_AMOUNT	-0.071***	-0.047**			-0.030	0.003
	(-7.940)	(-2.221)			(-1.103)	(0.113)
DISP * MISS_AMOUNT	**0.495*** **				**0.202**	
	(3.824)				**(0.544)**	
ΔDISP * MISS_AMOUNT		**1.071*** **				**0.844***
		(2.611)				**(1.741)**
CONSENSUS_CHG	-0.009**	-0.029***	-0.004	-0.002	-0.016***	-0.015**
	(-2.478)	(-2.650)	(-0.893)	(-0.576)	(-2.645)	(-2.318)
INDUCED_ΔETR	0.043**	0.095**	0.020	0.028	0.111***	0.107***
	(2.491)	(2.219)	(0.929)	(1.290)	(3.939)	(3.928)
TAX_OWED	0.011**	0.045***	0.008	0.011**	0.015*	0.017**
	(2.564)	(3.117)	(1.611)	(2.254)	(1.891)	(2.077)
ETR3	-0.045***	-0.134***	-0.034***	-0.039***	-0.072***	-0.081***
	(-10.233)	(-9.501)	(-6.425)	(-6.964)	(-8.264)	(-9.076)
ACCRUALS	-0.005***	-0.013***	-0.007***	-0.006***	-0.004***	-0.005***
	(-8.743)	(-9.911)	(-7.489)	(-7.112)	(-5.196)	(-5.759)
LNANALYSTS	0.001*	0.003	0.001	0.001	0.003*	0.002
	(1.690)	(1.284)	(1.350)	(0.792)	(1.789)	(1.373)
SPREAD	-0.084	0.062	0.061	0.042	-0.264*	-0.268*
	(-1.082)	(0.277)	(0.807)	(0.580)	(-1.769)	(-1.784)
EARN_VOL	-0.003	0.006	-0.004	-0.003	0.010	0.010
	(-0.490)	(0.300)	(-0.712)	(-0.468)	(0.702)	(0.659)
FOREIGN	-0.001*	0.004*	-0.001	-0.002*	-0.001	-0.001
	(-1.675)	(1.786)	(-1.283)	(-1.781)	(-0.749)	(-0.813)
ANALYST_CHANGE	-0.000	0.000	0.000	0.000	-0.001*	-0.001
	(-0.488)	(0.319)	(0.287)	(0.448)	(-1.718)	(-1.264)
LNAT	-0.000	-0.003***	-0.001*	-0.001**	-0.001	-0.001
	(-1.552)	(-3.781)	(-1.909)	(-2.049)	(-1.254)	(-1.426)
Q4_GUIDANCE	0.001	-0.001	0.001	0.001	0.001	0.002
	(0.829)	(-0.517)	(0.845)	(1.250)	(0.840)	(1.033)
LAG_ETR4_ETR3	0.002	0.006	0.001	0.000	0.005	0.006**
	(1.132)	(1.553)	(0.683)	(0.202)	(1.516)	(2.064)
Constant	0.007	0.044***	-0.001	0.003	0.018	0.016
	(1.029)	(2.618)	(-0.254)	(0.651)	(1.488)	(1.082)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,057	9,435	5,338	5,336	3,733	3,746
R^2	0.130	0.181	0.135	0.120	0.145	0.147

***, **, * Represent significance levels at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). Coefficients and their respective t-statistics are presented. Variable definitions are provided in *Appendix A*. We use robust standard errors and remove influential observations using studentized residuals greater than the absolute value of 2.

Table 6
Nonlinear effect of dispersion.

DV = *ETR4_ETR3*	(1)	(2)
Variable	*BEAT* firms	*MISS* firms
DISP	0.073***	0.103***
	(3.099)	(3.840)
MISS_AMOUNT		0.114*
		(1.783)
BEAT_AMOUNT	0.119***	
	(2.905)	
*DISP * MISS_AMOUNT*		-3.718***
		(-3.839)
*DISP * BEAT_AMOUNT*	-1.910**	
	(-2.515)	
MISS_AMOUNT^3		-17.393**
		(-2.339)
BEAT_AMOUNT^3	-4.131	
	(-0.927)	
*DISP*MISS_AMOUNT^3*		466.429***
		(4.378)
*DISP*BEAT_AMOUNT^3*	136.148*	
	(1.687)	
Constant	-0.002	0.008
	(-0.441)	(0.522)
Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	5,337	3,734
R^2	0.137	0.119

***, **, * Represent significance levels at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). Coefficients and their respective t-statistics are presented. Variable definitions are provided in *Appendix A*. We use robust standard errors and remove influential observations using studentized residuals greater than the absolute value of 2.

Table 7
ETR Management – Earnings Guidance.

Panel A: Firms Providing Guidance DV = *ETR4_ETR3*	(1)	(2)
Variable	*BEAT* firms	*MISS* firms
DISP	0.095***	-0.041
	(5.286)	(-1.151)
MISS_AMOUNT		-0.072
		(-1.265)
BEAT_AMOUNT	0.105***	
	(4.595)	
DISP * MISS_AMOUNT		**1.060**
		(1.537)
DISP*BEAT_AMOUNT	**-2.024*****	
	(-4.319)	
CONSENSUS_CHG	-0.012**	-0.029**
	(-2.261)	(-2.222)
INDUCED_ΔETR	0.108**	0.071*
	(2.462)	(1.730)
TAX_OWED	0.002	0.066***
	(0.258)	(3.543)
ETR3	-0.100***	-0.182***
	(-4.886)	(-6.495)
ACCRUALS	-0.008***	-0.005**
	(-5.531)	(-2.533)
LNANALYSTS	0.003	0.006
	(1.111)	(1.216)
SPREAD	0.073	-0.234
	(0.477)	(-0.831)
EARN_VOL	0.011	-0.021
	(0.585)	(-0.672)
FOREIGN	-0.001	-0.008
	(-0.323)	(-1.266)
ANALYST_CHANGE	0.001	0.001
	(1.614)	(0.846)
LNAT	0.002	0.000
	(0.738)	(0.009)
LAG_ETR4_ETR3	-0.004	-0.003
	(-1.463)	(-0.716)
Constant	-0.006	0.116***
	(-0.658)	(0.846)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	3,213	2,182
R^2	0.202	0.201

(continued)

Table 7, continued

Panel B: Firms Not Providing Guidance DV = *ETR4_ETR3*	(1)	(2)
Variable	*BEAT* firms	*MISS* firms
DISP	0.018	0.106**
	(0.671)	(2.001)
MISS_AMOUNT		0.043
		(0.537)
BEAT_AMOUNT	0.005	
	(0.119)	
DISP * MISS_AMOUNT		**-0.738**
		(-0.822)
DISP*BEAT_AMOUNT	**0.205**	
	(0.435)	
CONSENSUS_CHG	0.005	-0.007
	(0.535)	(-0.462)
INDUCED_ΔETR	-0.006	0.082
	(-0.157)	(0.994)
TAX_OWED	-0.001	0.006
	(-0.085)	(0.222)
ETR3	-0.118***	-0.218***
	(-3.519)	(-4.611)
ACCRUALS	-0.006***	-0.002
	(-3.587)	(-1.172)
LNANALYSTS	0.002	0.014
	(0.559)	(1.353)
SPREAD	-0.165	0.077
	(-0.750)	(0.161)
EARN_VOL	0.014	0.131*
	(0.480)	(1.925)
FOREIGN	-0.003	0.004
	(-0.477)	(0.342)
ANALYST_CHANGE	-0.002**	-0.004
	(-2.264)	(-1.316)
LNAT	-0.001	0.007
	(-0.234)	(0.658)
LAG_ETR4_ETR3	-0.000	0.015**
	(-0.030)	(2.044)
Constant	0.026	-0.100
	(0.932)	(-1.597)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	2,121	1,557
R^2	0.181	0.231

***, **, * Represent significance levels at the 1 percent, 5 percent, and 10 percent levels, respectively (two-tailed). Coefficients and their respective t-statistics are presented. Variable definitions are provided in *Appendix A*. We use robust standard errors and remove influential observations using studentized residuals greater than the absolute value of 2. All regressions include year and one-digit SIC industry fixed effects.